

Application No. 10/645,349  
Response to Office Action of January 30, 2006

Attorney Docket No. 16131US02

### REMARKS / ARGUMENTS

The present application includes pending claims 1-33, all of which have been rejected. The Applicants respectfully submit that the claims define patentable subject matter.

Claims 10-33 remain rejected under 35 U.S.C. 102(b) as being anticipated by IDS document Rouphael (hereinafter, Rouphael). Claims 1-28 remain rejected under 35 U.S.C. 102(b) as being anticipated by IDS document Klukas (hereinafter, Klukas). The Applicants respectfully traverse these rejections at least for the reasons previously set forth during prosecution and the following:

#### I. Rouphael Does Not Anticipate Claims 10-33

The Applicants first turn to the rejection of claims 10-33 under 35 U.S.C. 102(b) as being anticipated by Rouphael. With regard to the anticipation rejections under 102(b), MPEP 2131 states that "[a] claim is anticipated only if **each and every element** as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." See Manual of Patent Examining Procedure (MPEP) at 2131 (internal citation omitted). Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." See *id.* (internal citation omitted).

Rouphael discloses "a spatial interpolation algorithm for the upsampling...of uniform linear arrays (ULAs)...to enhance performance of a code division multiple access (CDMA) cellular antenna system." See Rouphael at Abstract. More specifically, Rouphael teaches that "the ULA is interpolated to within the spatial Nyquist rate...by placing a virtual antenna element half way in between every two real adjacent antenna elements." See *id.* Furthermore, Rouphael discloses a ULA interpolation algorithm and how the ULA interpolation algorithm may be used

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as a pre-processing procedure. See Rouphael at page 531, Section I, 3<sup>rd</sup> paragraph.

**A. Rejection of Independent Claim 10**

With regard to the rejection of independent claim 10 under Rouphael, the Office Action states that the Applicants' arguments with regard to claim 10, stated in the January 5, 2006 Response, fail to comply with 37 C.F.R. § 1.111(b) "because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the reference." See the Office Action at page 2. The Applicants submit that Rouphael does not disclose or suggest at least the limitation of "*an array processing module* including M signal processing chains ... coupled to one of the M physical antenna elements...the array processing module is configured to generate N signal response values for the antenna array as a function of the M replicas of the received signal...the N signal response values include at least one virtual antenna response value...N is greater than M," as claimed by the Applicants in independent claim 10. The Applicants submit that this argument specifically points out how the language of claim 10 patentably distinguishes the Applicants' invention from Rouphael. Namely, the Applicants specifically point out that Rouphael does not teach or disclose an array processing module with the characteristics disclosed in independent claim 10. Therefore, the Applicants submit that the above argument with regard to independent claim 10 complies with 37 C.F.R. § 1.111(b).

**B. Inherency**

The Office Action states the following:

While Rouphael stresses the procedure of array processing, it is inherent that hardware must be present to perform the procedural steps, specifically, an array processing module including M signal

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processing chains, one for each of the M antenna elements.

See the Office Action at page 3. The Applicants submit that a rejection based on inherency must include a statement of the rationale or evidence tending to show inherency. See MPEP at § 2112. "The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic." See *id. citing In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.

*In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). The Applicants respectfully submit that neither Rouphael itself nor the Office Action "make[s] clear that the missing descriptive matter," said to be inherent "is necessarily present in" Rouphael. *For example, the Applicants submit it is not inherent that an array processing module must be present in Rouphael, with M signal processing chains, one for each of all of the M antenna elements. In this regard, it is also not inherent that an array processing module must be present in Rouphael where the array processing module generates N signal responses using all of the generated M replicas of the received signal.*

A rejection based on inherency must be based on factual or technical reasoning:

In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the

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allegedly inherent characteristic necessarily flows from  
the teaching of the applied prior art.

*Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

The Applicants respectfully submit that the Office Action does not contain a basis in fact and/or technical reasoning to support the rejection based on inherency. Instead, as recited above, at least claim 10 of the present application stands rejected based on a conclusory statement of inherency, rather than upon a "basis in fact and/or technical reasoning." Accordingly, the Applicants respectfully submit that, absent a "basis in fact and/or technical reasoning" for the rejection of record, that the rejection of claim 10 should be reconsidered and withdrawn.

**C. Rejection of Independent Claim 20**

With regard to the rejection of independent claim 20 under Rouphael, the Office Action states that the Applicants' arguments with regard to claim 20, stated in the January 5, 2006 Response, fail to comply with 37 C.F.R. § 1.111(b) "because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the reference." See the Office Action at page 3.

The Applicants submit that Rouphael does not disclose or suggest at least the limitation of "means for determining a response of each of the M physical antenna elements to the signal," as claimed by the Applicants in independent claim 20. In addition, Rouphael does not disclose or suggest at least the limitation of "means for generating, as a function of the responses of the M physical antenna elements to the signal, N responses to the signal, respectively associated with N spatial locations along the antenna array, wherein at least one of the N spatial locations is not coincident with a location of any of the M physical antenna elements," as claimed by the Applicants in independent claim 20.

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The Applicants submit that the above argument with regard to claim 20 specifically points out how the language of claim 20 patentably distinguishes the Applicants' invention from Roupael. Namely, the Applicants specifically point out that Roupael does not teach or disclose means for determining a response of each of the M physical antenna elements to the signal and means for generating, as a function of the responses of the M physical antenna elements to the signal, N responses to the signal. Therefore, the Applicants submit that the above argument with regard to independent claim 20 complies with 37 C.F.R. § 1.111(b).

#### D. Inherency

The Office Action states the following:

While Roupael stresses the procedure of array processing, it is inherent that hardware must be present to perform the procedural steps, specifically, a means for determining, and a means for generating.

See the Office Action at page 4. The Applicants submit that a rejection based on inherency must include a statement of the rationale or evidence tending to show inherency. See MPEP at § 2112. "The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic." See *id. citing In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.

*In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

The Applicants respectfully submit that neither Roupael itself nor the Office

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Action "make[s] clear that the missing descriptive matter," said to be inherent "is necessarily present in" Rouphael. *For example, the Applicants submit it is not inherent that a means for determining a response of each of the M physical antenna elements must be present in Rouphael. In this regard, it is also not inherent that means for generating, as a function of the responses of the M physical antenna elements to the signal, must be present in Rouphael.*

A rejection based on inherency must be based on factual or technical reasoning:

In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teaching of the applied prior art.

*Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

The Applicants respectfully submit that the Office Action does not contain a basis in fact and/or technical reasoning to support the rejection based on inherency. Instead, as recited above, at least claim 20 of the present application stands rejected based on a conclusory statement of inherency, rather than upon a "basis in fact and/or technical reasoning." Accordingly, the Applicants respectfully submit that, absent a "basis in fact and/or technical reasoning" for the rejection of record, that rejection of claim 20 should be reconsidered and withdrawn.

#### **E. Rejection of Independent Claim 29**

With regard to the rejection of independent claim 29 under Rouphael, the Office Action states that the Applicants' arguments with regard to claim 29, stated in the January 5, 2006 Response, fail to comply with 37 C.F.R. § 1.111(b) "because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the reference." See the Office Action at page

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4.

The Applicants submit that Rouphael does not disclose or suggest at least the limitation of "an interpolation module coupled to the M signal processing chains, wherein the interpolation module is configured to generate N signal response values for the antenna array as a function of the M replicas of the received signal, wherein N is greater than M," as claimed by the Applicants in independent claim 29, as amended.

The Applicants submit that the above argument with regard to claim 29 specifically points out how the language of claim 29 patentably distinguishes the Applicants' invention from Rouphael. Namely, the Applicants specifically point out that Rouphael does not teach or disclose an interpolation module coupled to the M signal processing chains, with the characteristics disclosed in independent claim 29. Therefore, the Applicants submit that the above argument with regard to independent claim 29 complies with 37 C.F.R. § 1.111(b).

#### F. Inherency

The Office Action states the following:

While Rouphael stresses the procedure of array processing, it is inherent that hardware must be present to perform the procedural steps, specifically, an interpolation module for interpolating, and an array processing module including M signal processing chains, one for each of the M antenna elements.

See the Office Action at pages 4 and 5. The Applicants submit that a rejection based on inherency must include a statement of the rationale or evidence tending to show inherency. See MPEP at § 2112. "The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic." See *id. citing In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

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To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.

*In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). The Applicants respectfully submit that neither Rouphael itself nor the Office Action "make[s] clear that the missing descriptive matter," said to be inherent "is necessarily present in" Rouphael. *For example, the Applicants submit it is not inherent that an interpolation module coupled to the M signal processing chains, where the interpolation module is configured to generate N signal response values for an antenna array as a function of the M replicas of the received signal, must be present in Rouphael. In this regard, it is also not inherent that an array processing module including M signal processing chains must be present in Rouphael.*

A rejection based on inherency must be based on factual or technical reasoning:

In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teaching of the applied prior art.

*Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

The Applicants respectfully submit that the Office Action does not contain a basis in fact and/or technical reasoning to support the rejection based on inherency. Instead, as recited above, at least claim 29 of the present application stands rejected based on a conclusory statement of inherency, rather than upon a "basis in fact and/or technical reasoning." Accordingly, the Applicants respectfully



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submit that, absent a "basis in fact and/or technical reasoning" for the rejection of record, that rejection of claim 29 should be reconsidered and withdrawn.

**G. Rejection of Dependent Claims 11-19, 21-28, and 30-33**

Based on at least the foregoing, the Applicants believe the rejection of independent claims 10, 20, and 29 under 35 U.S.C. § 102(b) as being anticipated by Roupheal has been overcome and request that the rejection be withdrawn. Additionally, claims 11-19, 21-28, and 30-33 depend from independent claims 1, 10, 20, and 29, respectively, and are, consequently, also respectfully submitted to be allowable.

**II. Klukas Does Not Anticipate Claims 1-28**

The Applicants now turn to the rejection of claims 1-28 under 35 U.S.C. 102(b) as being anticipated by Klukas. With regard to the anticipation rejections under 102(b), MPEP 2131 states that "[a] claim is anticipated only if **each and every element** as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." See Manual of Patent Examining Procedure (MPEP) at 2131 (internal citation omitted). Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." See *id.* (internal citation omitted).

Klukas discloses "angle of arrival (AOA) estimation utilizing the MULTiple Signal Identification and Classification (MUSIC) algorithm...for land vehicle location systems." See Klukas at Abstract. More specifically, Klukas discloses the use of MUSIC "to estimate the AOA of individual arrivals as well as that of a cluster of arrivals." See *id.*

**A. Rejection of Independent Claims 1 and 20**

With regard to the rejection of independent claims 1 and 20 under Klukas,

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the Office Action states that the Applicants' arguments with regard to claims 1-9 and 20-29, stated in the January 5, 2006 Response, fail to comply with 37 C.F.R. § 1.111(b) "because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the reference." See the Office Action at page 5. The Applicants submit that Klukas does not disclose or suggest at least the limitation of "determining M responses of the M physical antenna elements to the signal, each of the M responses corresponding to one of the M physical antenna elements," as claimed by the Applicants in independent claim 1. Furthermore, Klukas does not disclose or suggest at least the limitation of "generating, as a function of the responses of the M physical antenna elements to the signal, N responses to the signal, respectively associated with N spatial locations along the antenna array, wherein at least one of the N spatial locations is not coincident with a location of any of the M physical antenna elements and is placed at a non-equidistant location between two successive physical antenna elements," as claimed by the Applicants in independent claim 1.

The Applicants submit that this argument specifically points out how the language of claims 1 and 20 patentably distinguishes the Applicants' invention from Klukas. Namely, the Applicants specifically point out that Klukas does not teach, for example, determining M responses of the M physical antenna elements and generating N responses associated with N spatial locations **along** the antenna array, as disclosed in claims 1 and 20. Furthermore, referring to Figure 1 of Klukas, locations 3 through 6 are **not along the array 1-2**. Therefore, the Applicants submit that the above argument with regard to independent claims 1 and 20 complies with 37 C.F.R. § 1.111(b) and that Klukas does not anticipate claims 1 and 20.

#### **B. Rejection of Independent Claim 10**

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With regard to the rejection of independent claim 10 under Klukas, the Office Action states that the Applicants' arguments with regard to claims 10-19, stated in the January 5, 2006 Response, fail to comply with 37 C.F.R. § 1.111(b) "because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the reference." See the Office Action at page 6. The Applicants submit that Klukas does not disclose or suggest at least the limitation of "an array processing module including M signal processing chains ... each of the M signal processing chains is coupled to one of the M physical antenna elements ... the array processing module is configured to generate N signal response values for the antenna array as a function of the M replicas of the received signal," as claimed by the Applicants in independent claim 10.

The Applicants submit that this argument specifically points out how the language of claim 10 patentably distinguishes the Applicants' invention from Klukas. Namely, the Applicants specifically point out that Klukas does not teach, for example, an array processing module including M signal processing chains and each of the M signal processing chains being coupled to one of the M physical antenna elements, as disclosed in claim 10. Therefore, the Applicants submit that the above argument with regard to independent claim 10 complies with 37 C.F.R. § 1.111(b) and that Klukas does not anticipate claim 10.

### **C. Inherency**

The Office Action states the following:

Further, while Klukas stresses the procedure of array processing, it is inherent that hardware must be present to perform the procedural steps, specifically, an array processing module including M signal processing chains, one for each of the M antenna elements.

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See the Office Action at page 6. The Applicants submit that a rejection based on inherency must include a statement of the rationale or evidence tending to show inherency. See MPEP at § 2112. "The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic." See *id. citing In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.

*In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). The Applicants respectfully submit that neither Klukas itself nor the Office Action "make[s] clear that the missing descriptive matter," said to be inherent "is necessarily present in" Klukas. *For example, the Applicants submit it is not inherent that an array processing module must be present in Klukas, with M signal processing chains, one for each of all of the M antenna elements. In this regard, it is also not inherent that an array processing module must be present in Klukas where the array processing module generates N signal responses using all of the generated M replicas of the received signal.*

A rejection based on inherency must be based on factual or technical reasoning:

In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teaching of the applied prior art.

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*Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

The Applicants respectfully submit that the Office Action does not contain a basis in fact and/or technical reasoning to support the rejection based on inherency. Instead, as recited above, at least claim 10 of the present application stands rejected based on a conclusory statement of inherency, rather than upon a "basis in fact and/or technical reasoning." Accordingly, the Applicants respectfully submit that, absent a "basis in fact and/or technical reasoning" for the rejection of record, that the rejection of claim 10 should be reconsidered and withdrawn.

**D. Rejection of Dependent Claims 2-9, 11-19, and 21-28**

Based on at least the foregoing, the Applicants believe the rejection of Independent claims 1, 10, and 20 under 35 U.S.C. § 102(b) as being anticipated by Klukas has been overcome and request that the rejection be withdrawn. Additionally, claims 2-9, 11-19, and 21-28 depend from independent claims 1, 10, and 20, respectively, and are, consequently, also respectfully submitted to be allowable.

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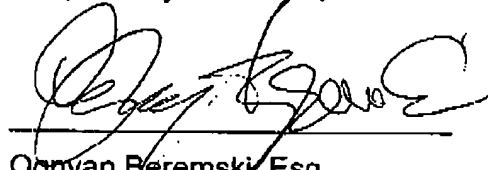
**CONCLUSION**

Based on the foregoing, Applicant believes that all claims 1-33 are in condition for allowance. If the Examiner disagrees, the Applicants respectfully request a telephone interview, and request that the Examiner telephone the undersigned Attorney for Applicants at (312) 775-8176.

The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to the deposit account of McAndrews, Held & Malloy, Ltd., Account No. 13-0017.

A Notice of Allowability is courteously solicited.

Respectfully submitted,



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